Ecosystem-based Planning

in the

Ghost River Watershed

A Project Summary

Bow River Basin Council Forum

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by

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Overall Goal:

Ghost River Watershed Alliance Society (GWAS) working with Silva Ecosystem Consultants (Silva) will develop an *Ecosystem-based Conservation Plan* (EBCP) for the Ghost River Watershed.

Key Aspects of the Plan:

- Evaluate the *character* and *condition* of the Ghost River Watershed
- Design *network of ecological reserves* to maintain natural ecosystem character and processes
- Recommend *human use areas* within the Ghost River Watershed with *standards* to maintain natural ecosystem character and processes
- Recommend *restoration treatments* to re-establish natural ecosystem character and processes

Natural means pre-industrial conditions and includes Indigenous management systems


Landscape: composition & structure


Patch: composition & structure
Aspen Clones

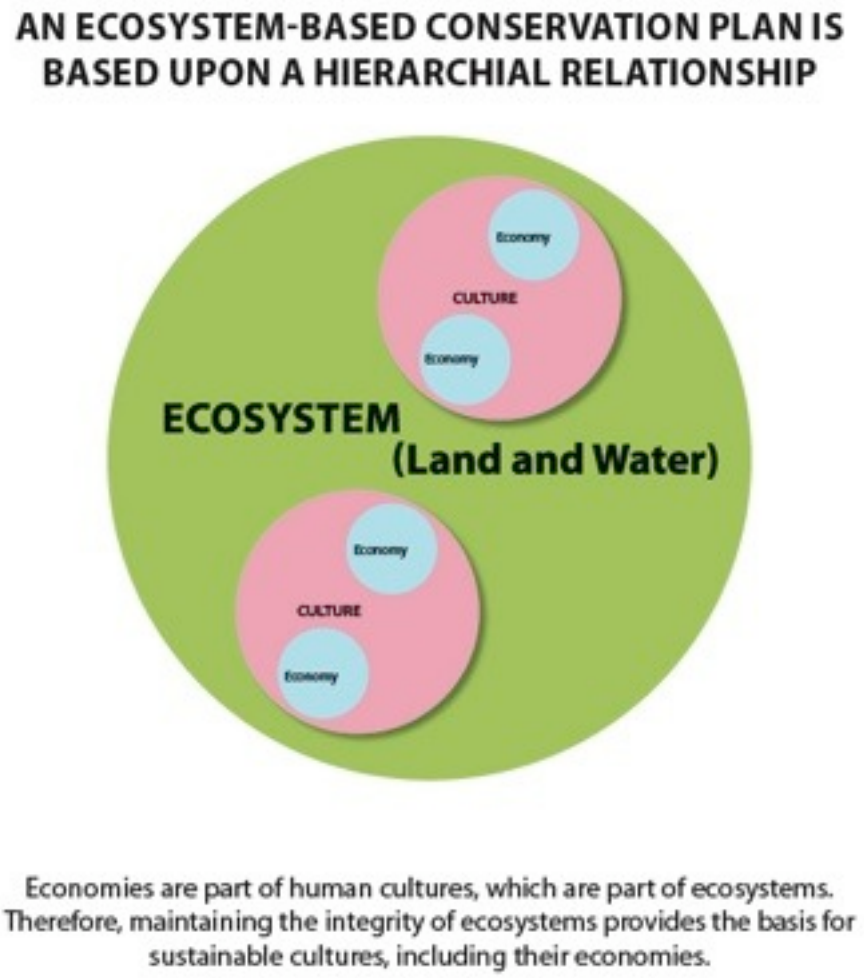

Patch: composition & structure
Old-growth Douglas-fir


Patch: composition & structure
Lodgepole Pine: matrix ecosystem

Approaches to land use planning--Value Driven

"Strong Sustainability"
values consistent with....

Ecosystem-based Conservation Planning



Focus on what to protect

Then on what to use....

Priorities of EBCP achieved through....

Identifying and respecting *ecological limits*--practical application of *precautionary principle*

Changes in ecosystems <u>beyond</u> ecological limits/ range of natural variability result in fundamental change, not in *natural* fluctuations to ecosystem function

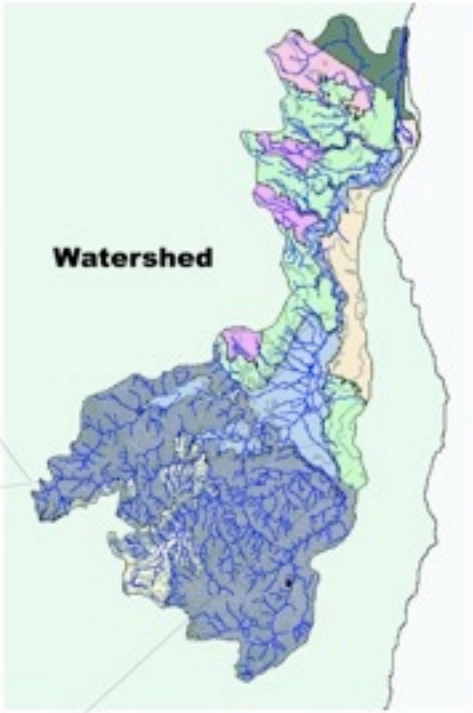
Priorities of EBCP achieved through....

Networks of *ecological* reserves & *cultural* reserves at multiple spatial scales

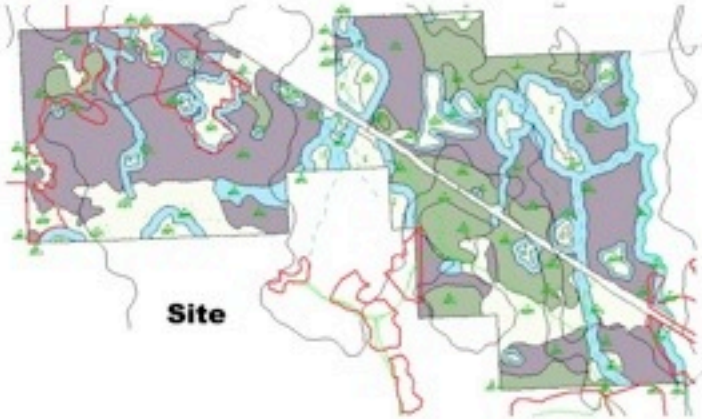
Ecosystem-Based Management -- *Planning Scales*

SubRegional - Territory

Landscape



Watershed



Site

SILVA

Priorities of EBCP achieved through....

Designation of *human use areas*....the foundation for diverse, community-based economies

- Restoration areas
- Cultural reserves
- Biodiversity nodes
- Recreation & Tourism
- Wildcrafting
- Agriculture & Ranching
- Timber
- Others within ecological limits


Conservation of Water---a primary issue
quality, quantity, & timing of flow
Small Streams
Large Rivers
Whole Watershed Conservation


Conservation of biological diversity---a primary issue
Ecological Integrity
Landscape
Patch


Mitigation of Global Warming---a primary issue

Ghost River: *Initial* Interpretive Maps and Ecological Impacts—foundation for EBCP

Purposes:
- -Initial understanding of character and condition of watershed
- -Community use & information gathering

Sources:
- -Alberta Vegetation Inventory
- -National Topographic System
- -Satellite Image—*old*
- -Spray Lake Sawmills Forest Mgmt Plan

-Indirect Data-

Map 1: Base Map and General Ecotypes—*the broad landscape picture*

Map 2: Dominant Tree Species and Age—*landscape pattern indicates habitats & disturbance patterns*

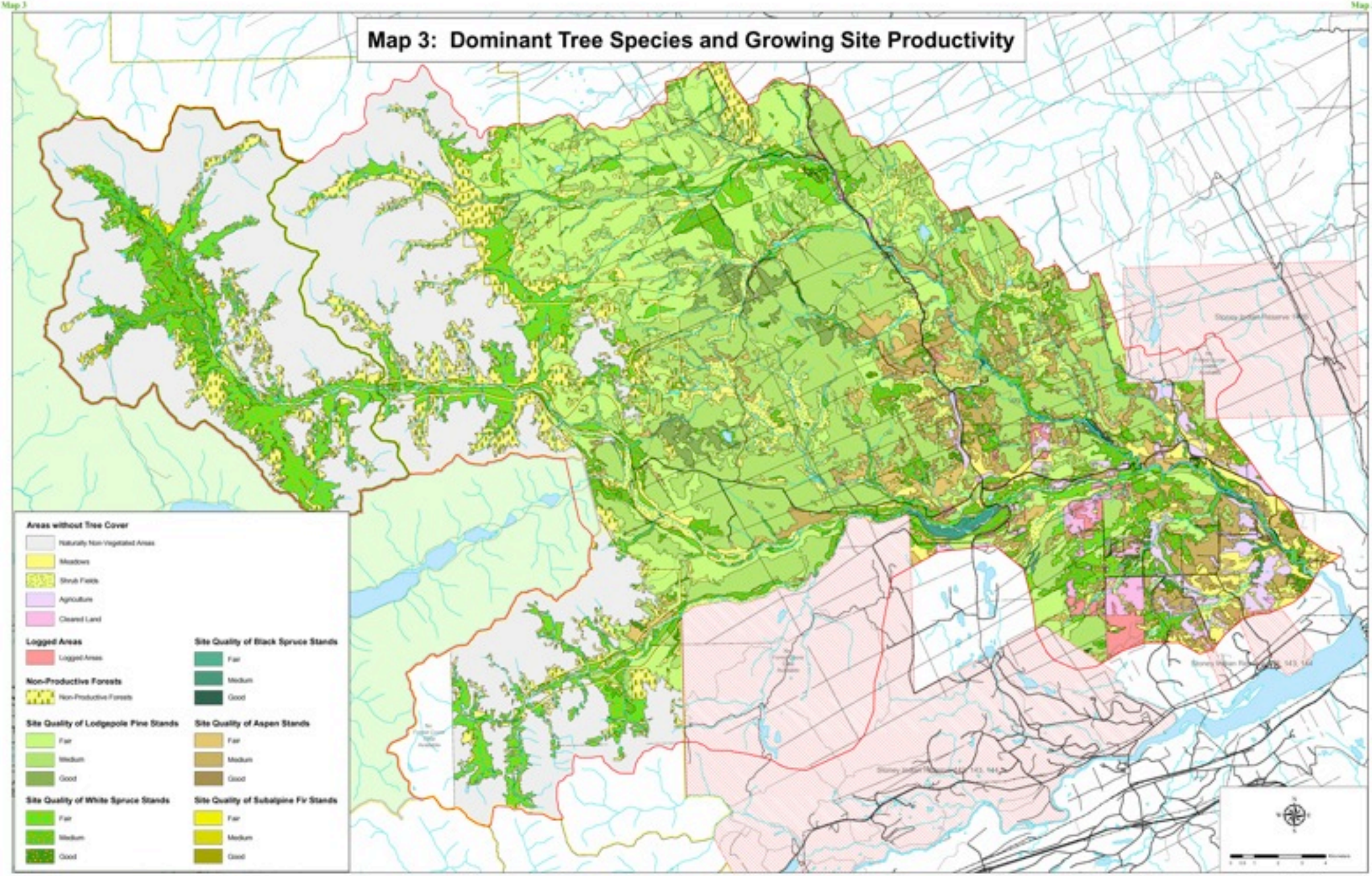
Map 3: Dominant Tree Species and Growing Site Productivity—*potential biological richness*

Map 4: Ecological Impacts from Logging—*negative impacts to ecological integrity*

Map 5: Satellite Image—*quasi photo for easy orientation (need better quality)*

Map 3

Map 3: Dominant Tree Species and Growing Site Productivity



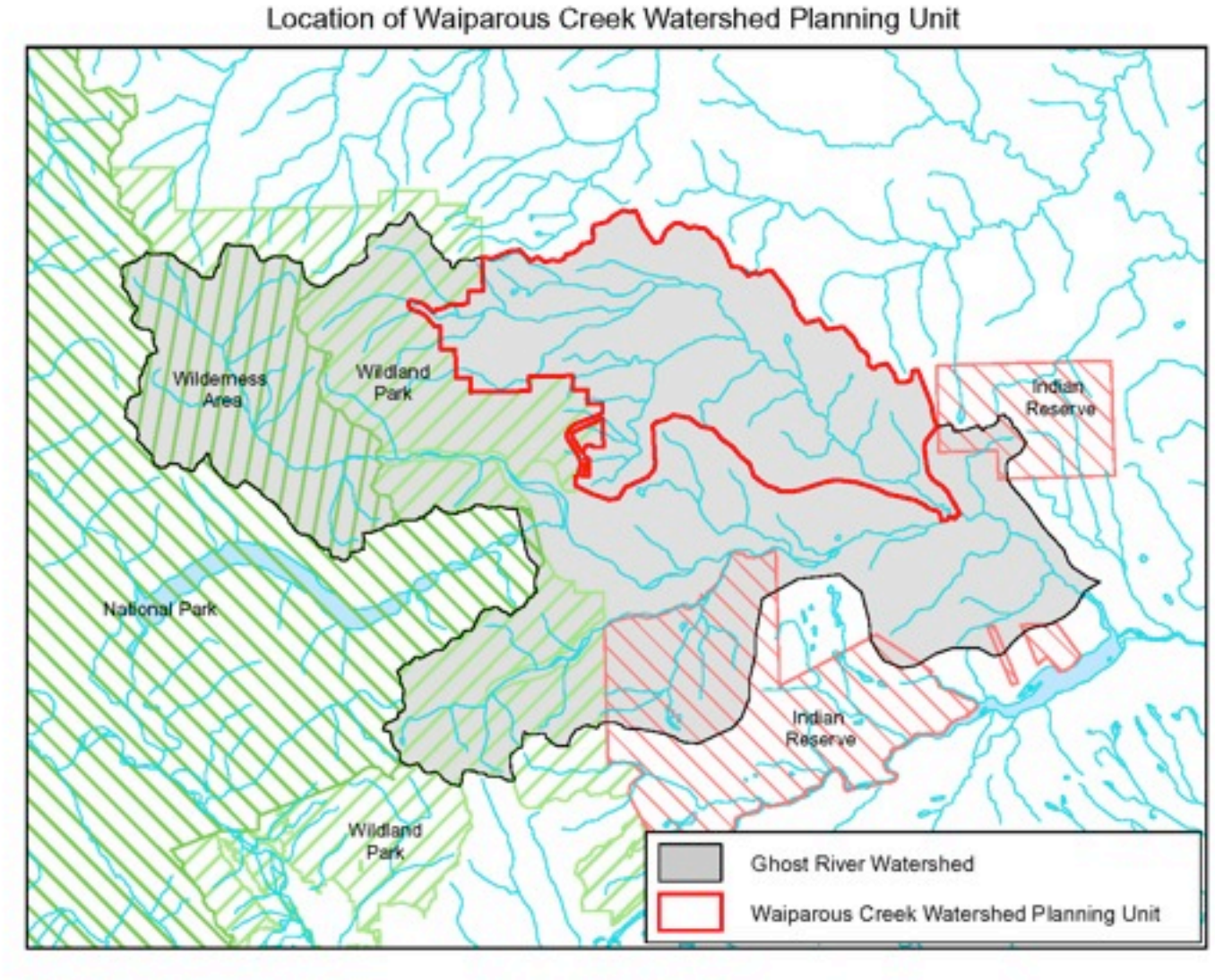
Ghost River Initial Interpretive Maps

Map 3: Dominant Tree Species and Growing Site Productivity:
Important Messages

- Less than 2% of Ghost R. consists of good growing site productivity—unique ecosystems
- White spruce, aspen, subalpine fir, & black spruce in all productivity classes are slightly more than 20% of landscape—unique ecosystems
- Lodgepole pine fair and medium productivity are 30% of landscape—the matrix, ecosystem that "holds" other ecosystems—vital to maintaining integrity of landscape
- Aspen important for biological diversity and natural fire breaks—restoring aspen important for overall ecosystem health

Class	Area (ha)	Percent of Total Area
Water	228	0.3%
Naturally Non-Vegetated	24,594	28.7%
Meadows	2,791	3.3%
Shrub Fields	5,288	6.2%
Agriculture	1,265	1.5%
Cleared Land	736	0.9%
Logged Areas	509	0.6%
Non-Productive Forests	5,306	6.2%
Lodgepole Pine Fair Site	11,807	13.8%
Lodgepole Pine Medium Site	15,049	17.6%
Lodgepole Pine Good Site	726	0.8%
White Spruce Fair Site	7,030	8.2%
White Spruce Medium Site	4,638	5.4%
White Spruce Good Site	348	0.4%
Aspen Fair Site	1,958	2.3%
Aspen Medium Site	3,058	3.6%
Aspen Good Site	20	0.0%
Subalpine Fir Fair Site	101	0.1%
Subalpine Fir Medium Site	23	0.0%
Subalpine Fir Good Site	0	0.0%
Black Spruce Fair Site	17	0.0%
Black Spruce Medium Site	204	0.2%
Black Spruce Good Site	28	0.0%
	85,722	100.0%

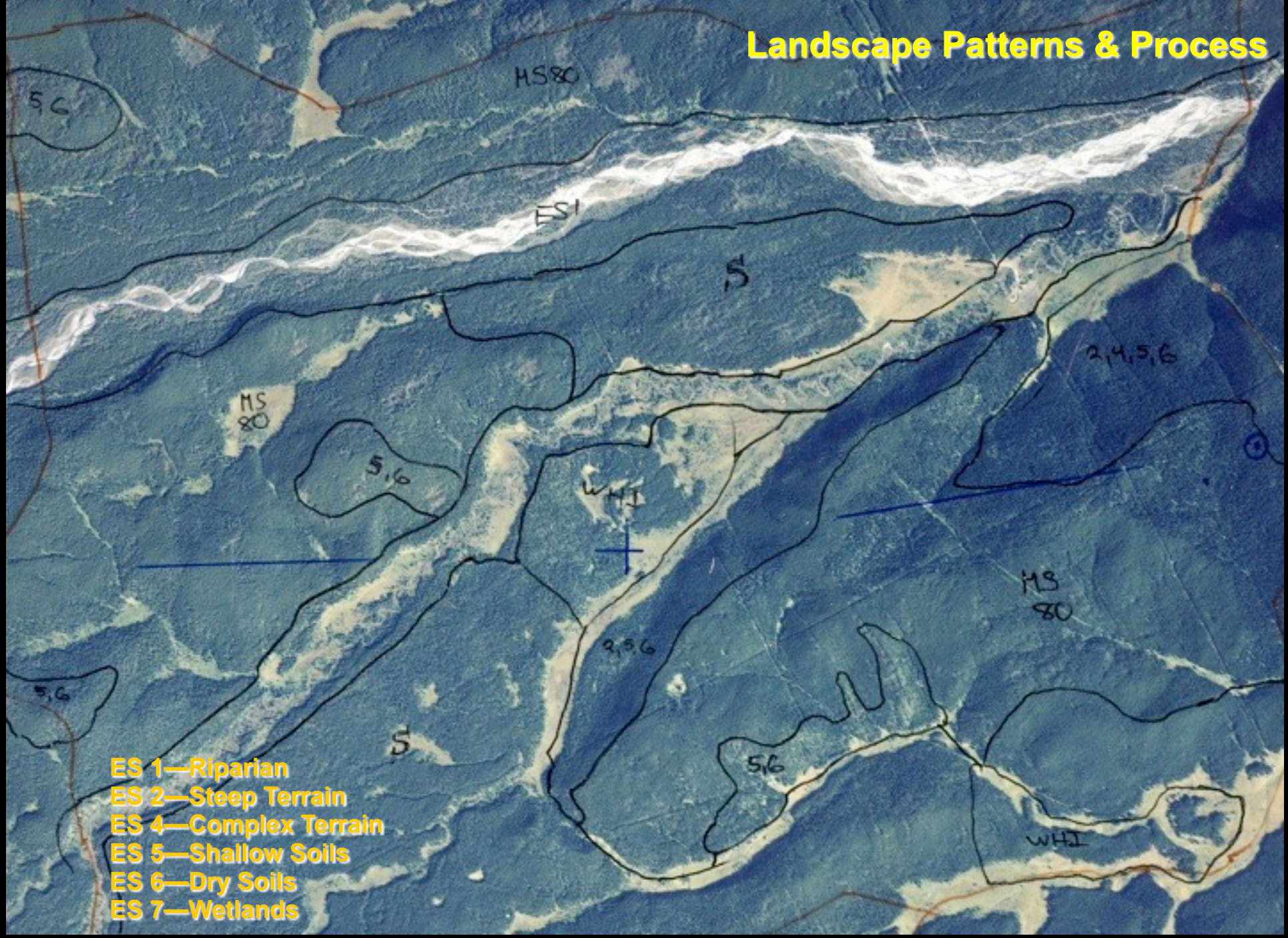
Waiparous Creek *Initial* EBCP



Ghost River Watershed: 85,722 hectares
Waiparous Creek Watershed: 25,600 hectares (30%)

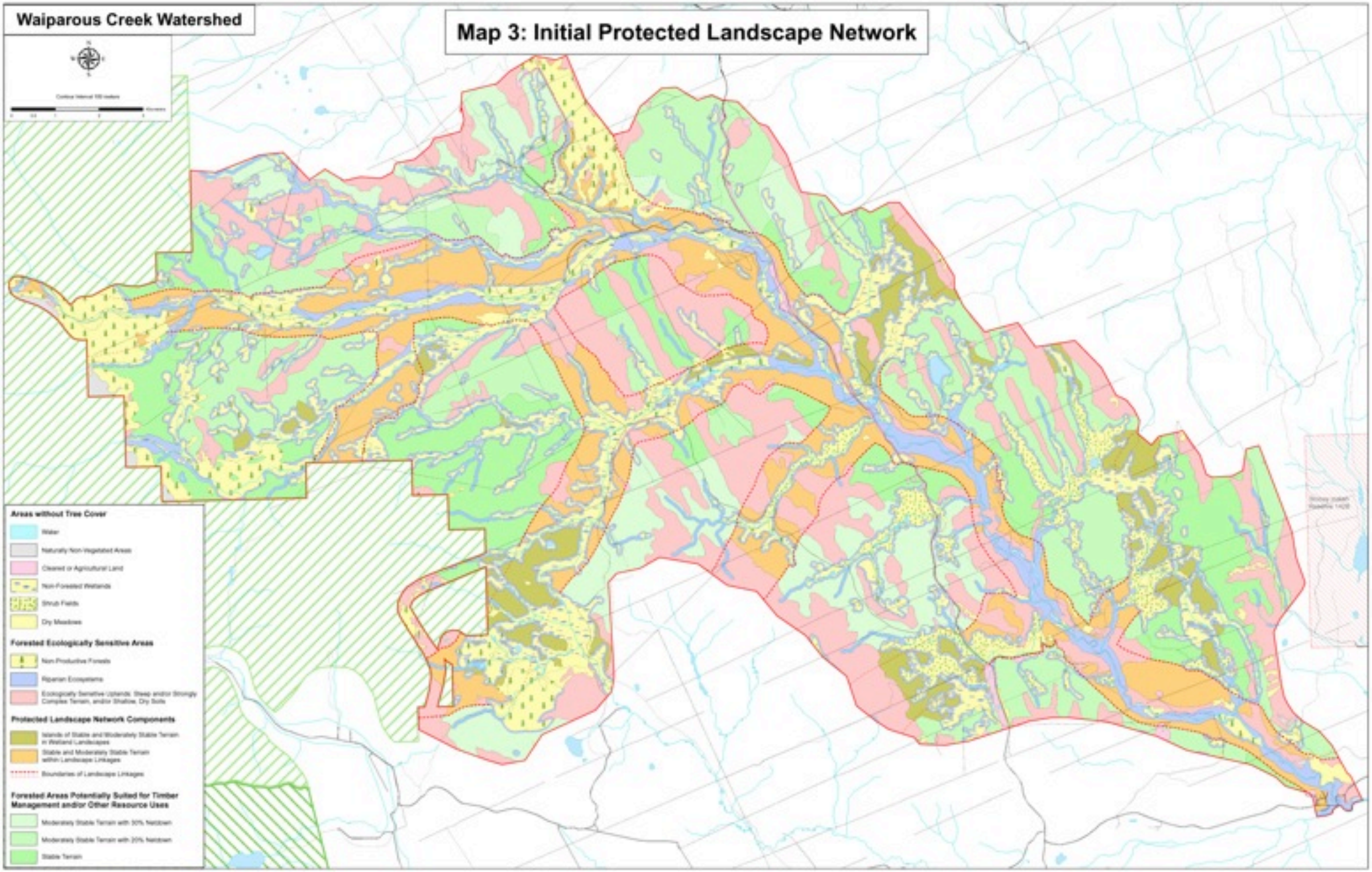
Waiparous Creek *Initial* EBCP

- Aerial photo interpretation informed by
  - GIS analysis—AVI data & topographic data (1:50,000)
  - Field assessments—*reconnaissance level*
- Interpretive Maps:
  - Map 1: Forest Vegetation—Dominant Tree Species & Age—landscape patterns and processes
  - Map 2: Ecological Sensitivity to Disturbance (ESD)—precautionary view of *ecological limits* to human activities
  - Map 3: Initial Protected Landscape Network (PLN)—network of *ecological reserves*—the framework to maintain ecological integrity
  - Map 4: Ecological Impacts from Logging and Recreation Development—primary land uses affecting ecological integrity
  - Map 5: Ecological Impacts of Human Use with Ecosystem Sensitivity to Disturbance and Protected Landscape Network—intrusion of human development on ecological limits and network of ecological reserves


Landscape Patterns & Process
MS80
5,6
ES1
S
2,4,5,6
MS
80
5,6
WHI
MS
80
2,5,6
5,6
S
5,6
WHI
ES 1—Riparian
ES 2—Steep Terrain
ES 4—Complex Terrain
ES 5—Shallow Soils
ES 6—Dry Soils
ES 7—Wetlands

Waiparous Creek Watershed

Map 3: Initial Protected Landscape Network



Waiparous Creek *Initial* EBCP

Map 3: Protected Landscape Network:

Important Messages

- PLN Consists of **diverse ecotypes:**
- Areas without Tree Cover 14%
  (except Agricultural Land)
  - Naturally non-vegetated areas
  - Non-forested wetlands
  - Shrub fields
  - Dry meadows
- Forested Eco. Sensitive Areas 40%
  - "Non-productive"—often unique
  - Riparian Ecosystems
  - Uplands: steep, stongly complex, and/or shallow, dry soils
- PLN Components 14%
  - Islands Stable/Mod.Stable in Wetlands
  - Linkages with Stable/Mod.Stable

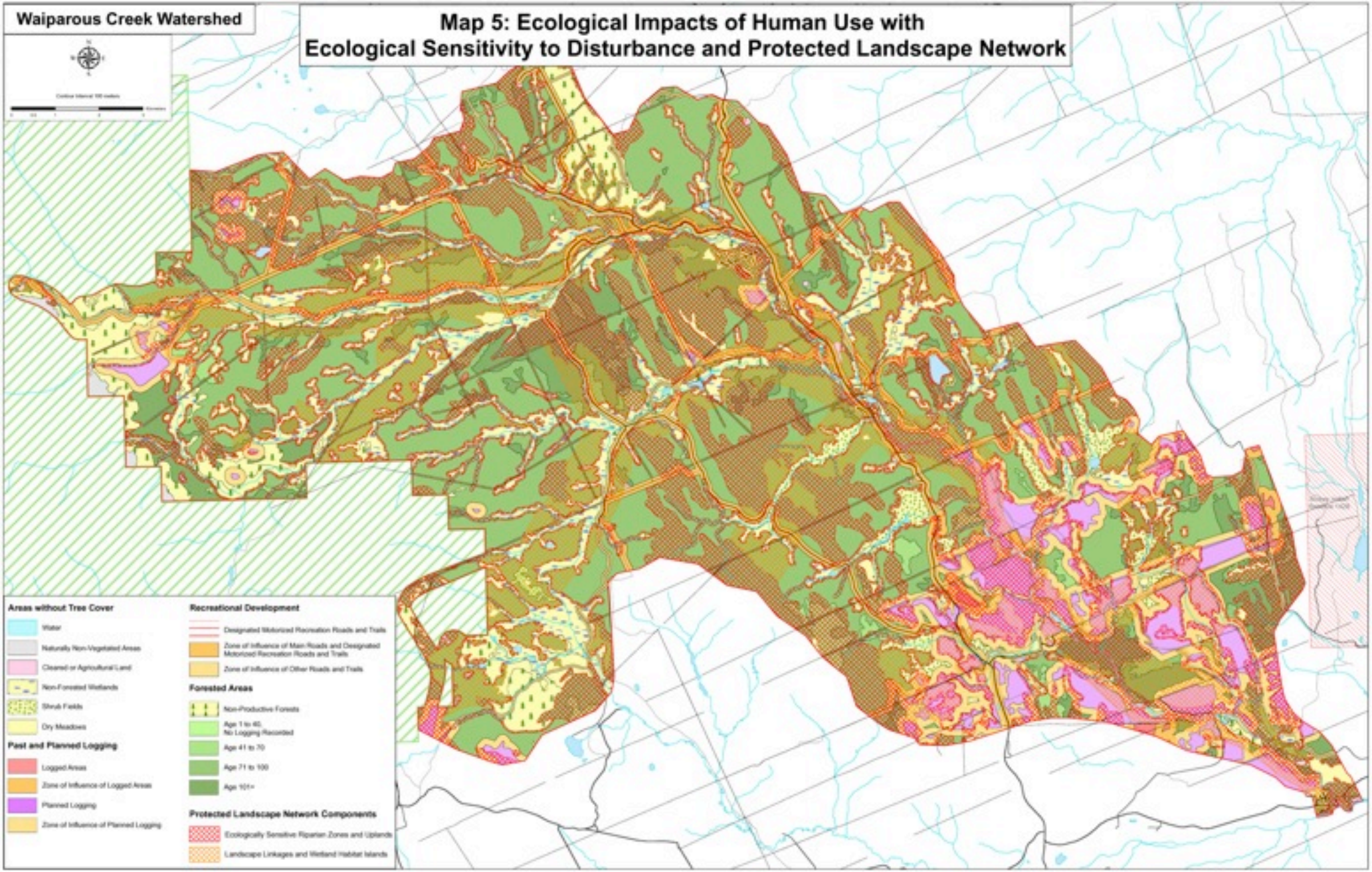
Total Landscape in PLN: 68%

- Eco. Sensitive Mod. Stable areas protected at patch level with *Protected Ecosystem Network (PEN)*

Class	Area (ha)	Percent of Total Area
Areas without Tree Cover		
Water	151	1%
Naturally Non-Vegetated Areas	67	0%
Cleared or Agricultural Land	193	1%
Non-Forested Wetlands	2,304	9%
Shrub Fields	731	3%
Dry Meadows	328	1%
Subtotal:	3,775	**15%**
Forested Ecologically Sensitive Areas		
Non-Productive Forests	1,620	6%
Riparian Ecosystems	3,610	14%
Ecologically Sensitive Uplands: Steep and/or Strongly Complex Terrain, and/or Shallow, Dry Soils	4,900	19%
Subtotal:	10,130	**40%**
Protected Landscape Network Components		
Islands of Stable and Moderately Stable Terrain in Wetland Landscapes	912	4%
Stable and Moderately Stable Terrain within Landscape Linkages	2,762	11%
Subtotal:	3,675	**14%**
Forested Areas Potentially Suited for Timber Management and/or Other Resource Uses		
Moderately Stable Terrain with 30% Netdown	1,989	8%
Moderately Stable Terrain with 20% Netdown	3,443	13%
Stable Terrain	2,589	10%
Subtotal:	8,020	**31%**
Total:	25,600	100%

Waiparous Creek Watershed

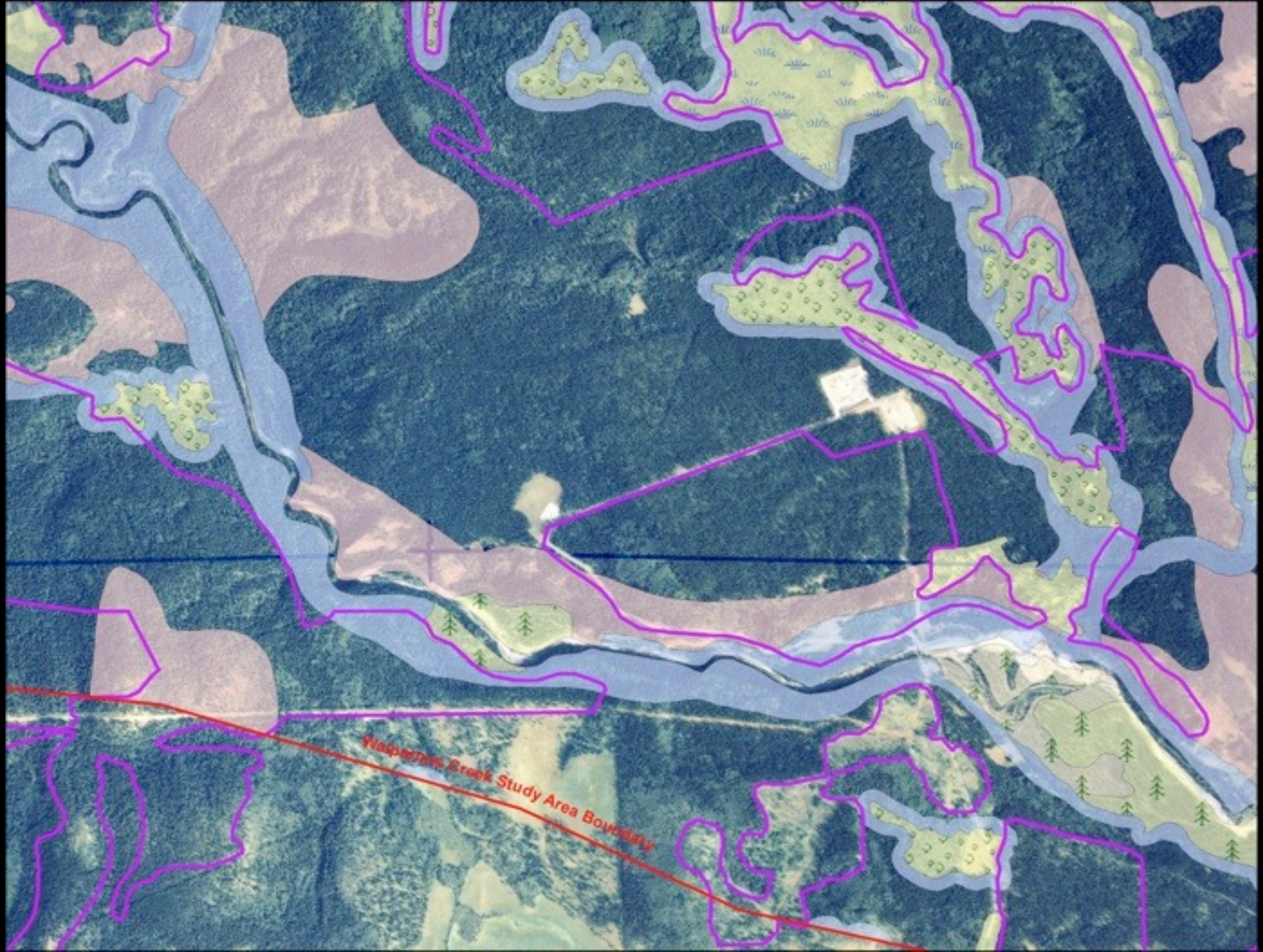
Map 5: Ecological Impacts of Human Use with Ecological Sensitivity to Disturbance and Protected Landscape Network

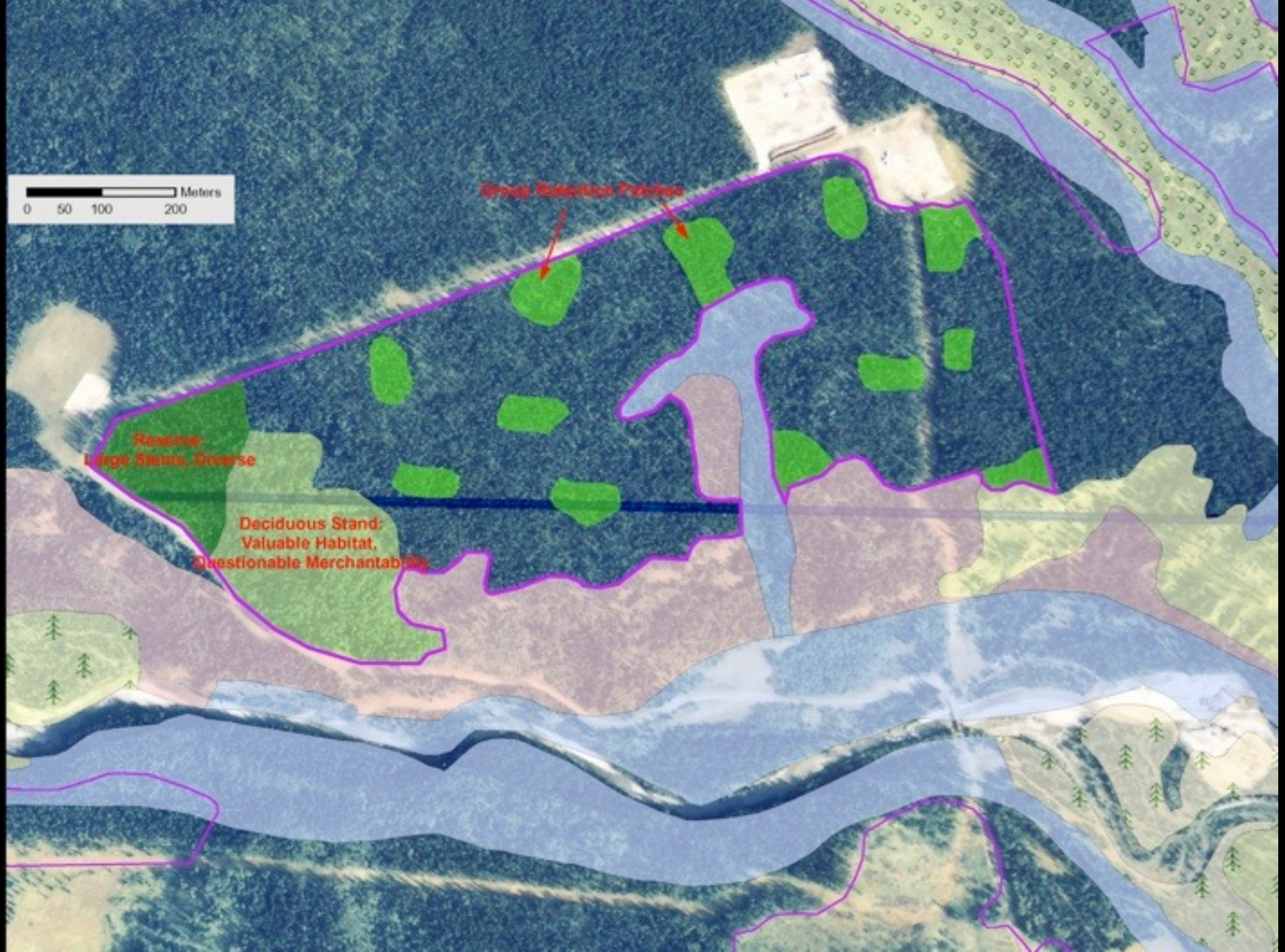


Map 5: Ecological Impacts of Human Use with Ecological Sensitivity to Disturbance and Protected Landscape Network: Important Messages

- Past and Planned Logging & Recreation Development has/will occur on *ecologically sensitive sites* and in *protected landscape network*
  - **59%** past and planned logging
  - **66%** main roads and designated motorized recreational vehicle roads and trails
- Human Use within *ecologically sensitive sites* and *protected landscape network* are ecological restoration areas


Hesperian Brook Study Area Boundary


Waparoke Creek Study Area Boundary


Meters
0 50 100 200
Group Retention Patches
Reserve:
Large Stems, Diverse
Deciduous Stand:
Valuable Habitat,
Questionable Merchantability

Ghost River
Ecosystem-based Conservation Plan

Next Steps

- Community Review & Direction from work completed
- Completion of *initial* ESD and PLN mapping for Ghost River outside of Waiparous Creek
- Field assessments—ground truthing
- Prepare EBCP & Review with community
- Work *collaboratively* with individuals and organizations to implement an ecosystem-based approach in the Ghost River watershed

Stewardship
Sacrificing in the present to protect the future

Think like a *Forest*—an *Ecosystem*